

Base map from U.S. Geological Survey
Picture Rock Hills 7.5' Quadrangle, 1971

SCALE 1:24000
CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1974
3300000 E

The Miscellaneous Publication Maps provide an outlet
for authors who are not Utah Geological Survey staff.
Not all aspects of this publication have been reviewed
by the UGS.

14.0°
249 MILS
1999 MAGNETIC DECLINATION
AT CENTER OF SHEET

GEOLOGIC MAP OF THE PICTURE ROCK HILLS QUADRANGLE, JUAB COUNTY, UTAH

by
Michael A. Shubat



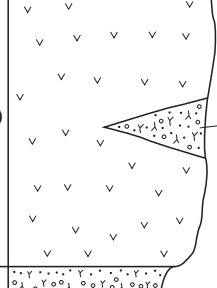

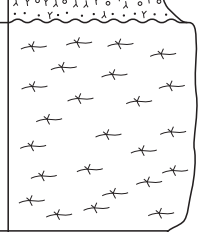

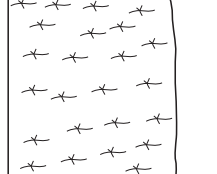
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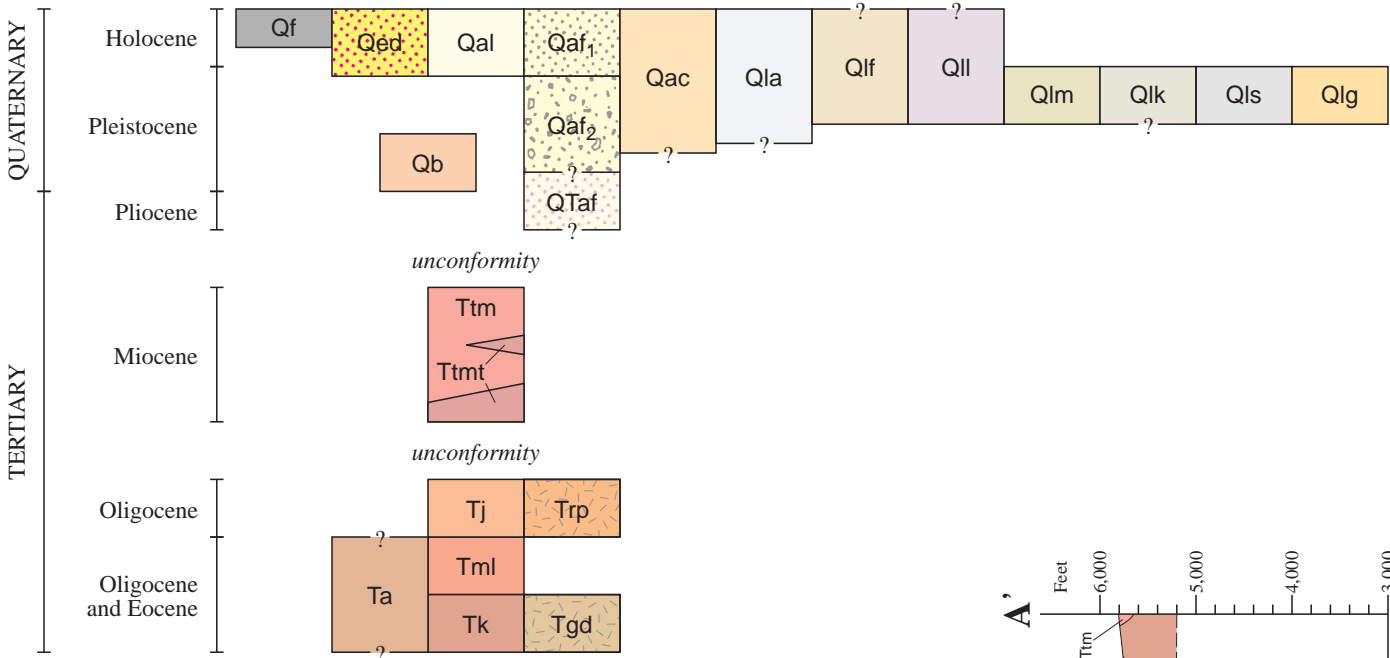
DESCRIPTION OF MAP UNITS

Qf	Fill (Holocene) - Locally-derived material mounded-up by ranchers to make stock-watering ponds along Picture Rock Wash.
Qal	Stream alluvium (Holocene) - Unconsolidated, poorly sorted clay, silt, sand, pebbles, cobbles, and boulders in modern stream channels, floodplains, and terraces 3 to 6 feet (1 to 2 m) above modern channels; generally less than 10 feet (3 m) thick.
Qaf ₁	Younger alluvial-fan deposits (Holocene and latest Pleistocene) - Unconsolidated, poorly sorted clay, silt, sand, and gravel found principally below the Bonneville shoreline; generally less than 10 feet (3 m) thick.
Qac	Alluvium and colluvium (Holocene and Pleistocene) - Unconsolidated, poorly sorted clay, silt, sand, pebbles, cobbles, and boulders in first-order drainages, on sheet-wash slopes below bedrock outcrops, and in poorly developed alluvial fans; generally less than 30 feet (9 m) thick.
Qed	Eolian dune (Holocene and late Pleistocene) - Well-sorted, silica sand and sand-sized, lithic grains in a poorly developed dune; about 6 feet (2 m) thick.
Qll	Lacustrine lagoon deposits (Holocene and latest Pleistocene) - Unconsolidated clay, silt, and sand in depressions behind cusped barrier bars; deposited in Lake Bonneville lagoons, and as slope-wash and eolian material in Holocene time; probably less than 10 feet (3 m) thick.
Qlf	Fine-grained lacustrine deposits (Holocene and latest Pleistocene) - Unconsolidated sand, silt, and lesser marl and calcareous clay; deposited in Lake Bonneville and locally contains Holocene alluvial and eolian sediments; generally less than 10 feet (3 m) thick.
Qlk	Lacustrine carbonate sand (latest Pleistocene) - Unconsolidated, calcium carbonate-rich, fine- to medium-grained sand, with coarse sand-sized to granule clasts, carbonate pellets and carbonate-coated gastropods; deposited just below the Provo shoreline; maximum thickness less than 15 feet (4.5 m).
Qlm	Lacustrine marl (latest Pleistocene) - Poorly consolidated white to gray marl and lesser clay, silt, and sand; characterized by abundant ostracodes; deposited in Lake Bonneville; exposed thickness up to 6 feet (2 m).
Qls	Lacustrine sand (latest Pleistocene) - Unconsolidated, moderately sorted, fine- to medium-grained sand with lesser silt and pebbles; grains are silica and volcanic rock fragments; compose barrier beaches between the Bonneville and Provo shorelines; probably less than 10 feet (3 m) thick.
Qlg	Lacustrine gravel (latest Pleistocene) - Unconsolidated sand, gravel (pebbles and cobbles), and silt forming beaches, barriers, tombolos, and spits in Lake Bonneville at and just below the Bonneville and Provo shorelines; may be as much as 30 feet (9 m) thick.
Qla	Undifferentiated lacustrine and/or alluvial deposits (Holocene and late Pleistocene) - Mostly unconsolidated sand and gravel (pebbles and cobbles) deposited in Lake Bonneville as waves reworked the surfaces of pre-Bonneville alluvial fans, and lacustrine deposits that were partially reworked by post-Bonneville streams and slope-wash; generally less than 10 feet (3 m) thick.
Qaf ₂	Intermediate-age alluvial-fan deposits (late to middle Pleistocene) - Unconsolidated, poorly sorted clay, silt, sand, pebbles, cobbles, and boulders above the Bonneville shoreline; fan surfaces are inactive and undergoing erosion, and are up to 20 feet (6 m) above modern drainages; generally less than 20 feet (6 m) thick.
Qb	Basalt of Crater Bench (early Pleistocene) - Black to dark-brown, vesicular basaltic andesite flow containing sparse phenocrysts of plagioclase, clinopyroxene, iron-titanium oxides, and orthopyroxene in a matrix of plagioclase, pigeonite, and glass; distal part of Crater Bench, a shield volcano centered on Fumarole Butte; dated at 0.88±0.1 and 0.95±0.1 Ma (Peterson and Nash, 1980; Galyardt and Rush, 1981); less than 20 feet (6 m) thick.
QTaf	Older alluvial-fan deposits (early Pleistocene and Pliocene) - Unconsolidated to semi-consolidated, poorly sorted clay, silt, sand, pebbles, cobbles, and boulders above the Bonneville shoreline; exposed thickness 60 feet (18 m) or more.
Ttm	Topaz Mountain Rhyolite (Miocene) - Divided into: Rhyolite flows, domes, and intrusions - White, gray, and purple rhyolite containing sparse (10 to 15 percent), small (0.08 inch [2 mm]) phenocrysts of quartz and sanidine, and lesser plagioclase, biotite, and opaque mineral phenocrysts in a matrix of devitrified glass; black to brown vitrophyre at the base of some flows and domes; less than 6.7±0.3 Ma; maximum exposed thickness 800 feet (240 m).
Tmt	Stratified tuff - Pale-tan to orange, very thick- to thin-bedded, nonwelded, lithic-rich rhyolitic tuff and volcanic sandstone; contains a variety of volcanic rock fragments, abundant pumice clasts, and sparse crystal fragments in an ash matrix; occurs as discontinuous air-fall and water-laid lenses beneath many rhyolite flows and domes; extensively zeolitized and feldspathically altered; 0 to 260 feet (0 to 80 m) thick.
Trp	Rhyolite porphyry (Oligocene) - Small, pale-gray to pink, light-tan weathering rhyolite porphyry dikes and plugs with large (up to 0.4 inch [1 cm]) phenocrysts of sanidine, quartz, plagioclase, and biotite in an aphanitic matrix; phenocrysts nearly absent near the margins of intrusions and become more abundant toward the interior; dated by Shubat and Snee (1992) at 35.14±0.15 Ma.
Tj	Joy Tuff (Oligocene) - Red-brown to pink, moderately to densely welded, rhyolitic ash-flow tuff; black vitrophyre locally present at base of unit and overlain by a black fiamme-rich zone; contains abundant, 0.08- to 0.3-inch (1- to 8-mm) phenocrysts of quartz, sanidine, plagioclase, and biotite, and as much as 14 percent lithic clasts; dated by Shubat and Snee (1992) at 34.88±0.06 Ma; maximum exposed thickness 540 feet (160 m), but more than 3,000 feet (915 m) penetrated in subsurface.
Tml	Mt. Laird Tuff (Oligocene and Eocene) - Lavender, pale-green, dark-green, and brown, moderately welded, dacitic ash-flow tuff; characterized by abundant, 0.08 to 0.47 inch (2 to 12 mm) phenocrysts of white plagioclase; other phenocrysts are hornblende, biotite, quartz, and clinopyroxene; dated by Shubat and Snee (1992) at 36.54±0.06 Ma; maximum exposed thickness 100 feet (30 m), but about 600 feet (180 m) penetrated in subsurface.
Tgd	Granodiorite porphyry (Oligocene and Eocene) - Light-olive-green plug containing 0.08 to 0.47 inch (2 to 12 mm) phenocrysts of plagioclase, quartz, biotite, hornblende, and clinopyroxene; matrix is fine grained to aphanitic and contains quartz, plagioclase, and potassium feldspar; propylitic alteration common; dated by Lindsey (1982) at 36.6±1.6 Ma.
Tk	Keg Tuff (Oligocene and Eocene) - Dark-red-brown to black, densely welded, moderately crystal-rich, dacitic ash-flow tuff; black vitrophyre locally present at base; abundant, bronze-weathering biotite prominent on surfaces parallel to layering; also contains plagioclase, biotite, quartz, and hornblende phenocrysts; dated by Shubat and Snee (1992) at 36.77±0.12 Ma; exposed thickness 500 feet (150 m).
Ta	Andesite of Keg Pass (Oligocene and Eocene) - Heterogeneous, dark-colored flows and less abundant lahars; flows contain phenocrysts of andesine, biotite, hornblende, quartz, clinopyroxene, and magnetite; lahars commonly at base; lahars contain clasts of andesite, quartzite, and limestone; propylitic alteration common; age variable, but as old as 39 and as young as 37 million years old; exposed thickness about 20 feet (6 m).

STRATIGRAPHIC COLUMN

SYSTEM	SERIES	FORMATION / MAP UNIT	SYM-BOL	THICKNESS Feet (Meters)	LITHOLOGY
QUATERNARY	Holocene	Quaternary deposits	Q	0-30 (0-9)	 <i>unconformity</i>
	Pleistocene	Basalt of Crater Bench	Qb	0-20 (0-6)	
	Pliocene	Older alluvial-fan deposits	QTaf	0-60+ (0-18+)	 <i>unconformity</i>
	Miocene	Topaz Mountain Rhyolite	Ttm	0-800 (0-240)	 Tmt
		Stratified tuff	Tmt	0-260 (0-80)	 <i>unconformity</i>
	Oligocene	Joy Tuff	Tj	0-540+ (0-160+)	 Avg. 34.88 ± 0.06 Ma
		Mt. Laird Tuff	Tml	0-100+ (0-30+)	 Avg. 36.54 ± 0.06 Ma - 37.39 Ma See correlation chart for probable relationships of Andesite of Keg Pass to Mt. Laird and Keg Tuffs.
		Andesite of Keg Pass	Ta	0-20+ (0-6+)	
Oligocene and Eocene		Keg Tuff	Tk	0-500+ (0-150+)	 36.77 ± 0.12 Ma Ar-Ar

CORRELATION OF MAP UNITS



MAP AND CROSS SECTION SYMBOLS

